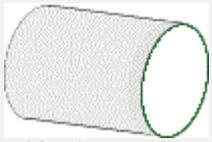
ENGINEERING STEELS + ALLOYS

1030 BRIGHT CARBON STEEL BAR

1030 is a medium tensile low hardenability carbon steel generally supplied in the cold drawn or turned and polished, or centreless ground condition, with a typical tensile strength range 500 - 850 Mpa, and Brinell hardness range 150 - 245.Characterised by good machinability, reasonable weldability with medium strength plus good ductility.
1030 has a low through hardening capability with sections up to around 40mm only generally responding satisfactorily. It is therefore generally used in the as supplied condition. Flame or induction hardening is also marginal due to its lower carbon content, nor will it respond satisfactorily to nitriding due to a lack of suitable alloying elements, and carburising while possible is not generally recommended.
1030 is used by all industry sectors for applications requiring higher strength than 1020 can provide or often for applications making use of its centreless ground finish.
Typical applications are: Axles, Connecting Rods, Guide Rods, Hydraulic Shafts, Motor Shafts, Rams, Spindles, Studs etc.

Colour Code	Stocked Sizes	
 White (Bar End)	Metric	8 mm - 140 mm Dia
	Imperial	3/16" - 7" Dia

Related Specifications	
Australia	AS 1443 - 1994 M1030
Germany	W.Nr 1.0528 C30 W.Nr 1.1178 CK30
Great Britain	BS970 - Part 3 - 1991 080M30 BS970 - 1955 EN5, 6, 6a
Japan	JIS G 4051 S30C
USA	AISI C1030 ASTM A29/A29M - 91 1030 SAE 1030 UNS G 10300

Chemical Composition		
	Min. %	**Max. %**
Carbon	0.25	0.35
Silicon	0	0.35
Manganese	0.30	0.90
Phosphorous	0	0.05
Sulphur	0	0.05

Typical Mechanical Properties - Cold Drawn, Turned and Polished and Centreless Ground Condition					
Cold Drawn Size mm		up to 16mm	17 - 38mm	39 - 63mm	Turned & Polished, & Precision Ground (all sizes)
Tensile Strength Mpa	Min	560	540	520	500
	Max	850	740	710	630
Yield Strength Mpa	Min	440	430	410	250
	Max	670	600	570	350

Elongation in 50mm %	Min	10	11	12	20
Hardness HB	Min	170	160	155	150
	Max	245	215	210	185
Typical Mechanical Properties - Hardened by Water Quench at 850 °C - 880 °C and Tempered Between 540°C - 680 °C					
Cold Drawn Size mm		up to 16mm	17 - 40mm	41 - 63mm	
Tensile Strength Mpa	Min	620	580	520	
	Max	760	730	650	
Yield Strength Mpa	Min	420	365	300	
Elongation in 50mm %	Min	13	16	17	
Hardness HB	Min	185	175	150	
	Max	225	215	195	

Forging

Heat to 1100 °C - 1200 °C maximum, hold until temperature is uniform throughout the section and commence forging.
Do not forge below 900 °C
Finished forgings may be air cooled.

Heat Treatment

Annealing

Heat to 850 °C - 900 °C hold until temperature is uniform throughout the section, and cool in furnace.

Hardening

Heat to 850 °C - 910 °C hold until temperature is uniform throughout the section, soak for 10 - 15 minutes per 25mm of section, and quench in water or brine.
Temper immediately while still hand warm.

Normalizing

Heat to 870 °C - 920 °C hold until temperature is uniform throughout the section, soak for 10 - 15 minutes per 25mm of section, and cool in still air.

Stress Relieving

Heat to 600 °C - 700 °C hold until temperature is uniform throughout the section, soak for 1 hour per 25mm of section, and cool in still air.

Tempering

Re heat to 540 °C - 680 °C as required, hold until temperature is uniform throughout the section, soak for 1 hour per 25mm of section, and cool in still air.

Notes on Heat Treatment

Heating temperatures, rate of heating, cooling and soaking times will vary due to factors such as work piece size/shape, also furnace type employed, quenching medium and work piece transfer facilities etc.
Please consult your heat treater for best results.

Machining

1030 has very good machinability in all as supplied conditions and all operations such as drilling, milling, tapping and turning etc. can be carried out satisfactorily as per machine manufacturers recommendations for suitable tool type, feeds and speeds.

Welding

1030 is readily weldable in all as supplied conditions providing the correct procedure is employed. Following welding the work piece immediately upon cooling to hand warm should be stress relieved at 600 °C - 700 °C if possible.
NB. Welding in the hardened and tempered condition is not recommended.

Welding Procedure

Low carbon electrodes are recommended.
Please consult your welding consumables supplier for suitable electrodes etc.Welding can be carried out by any of the standard welding processes.
Pre-heat larger sections up to 300 °C.
Post-weld slow cool in sand, dry lime or still air.

reliability is given, nor will any responsibility be taken for errors or omissions.